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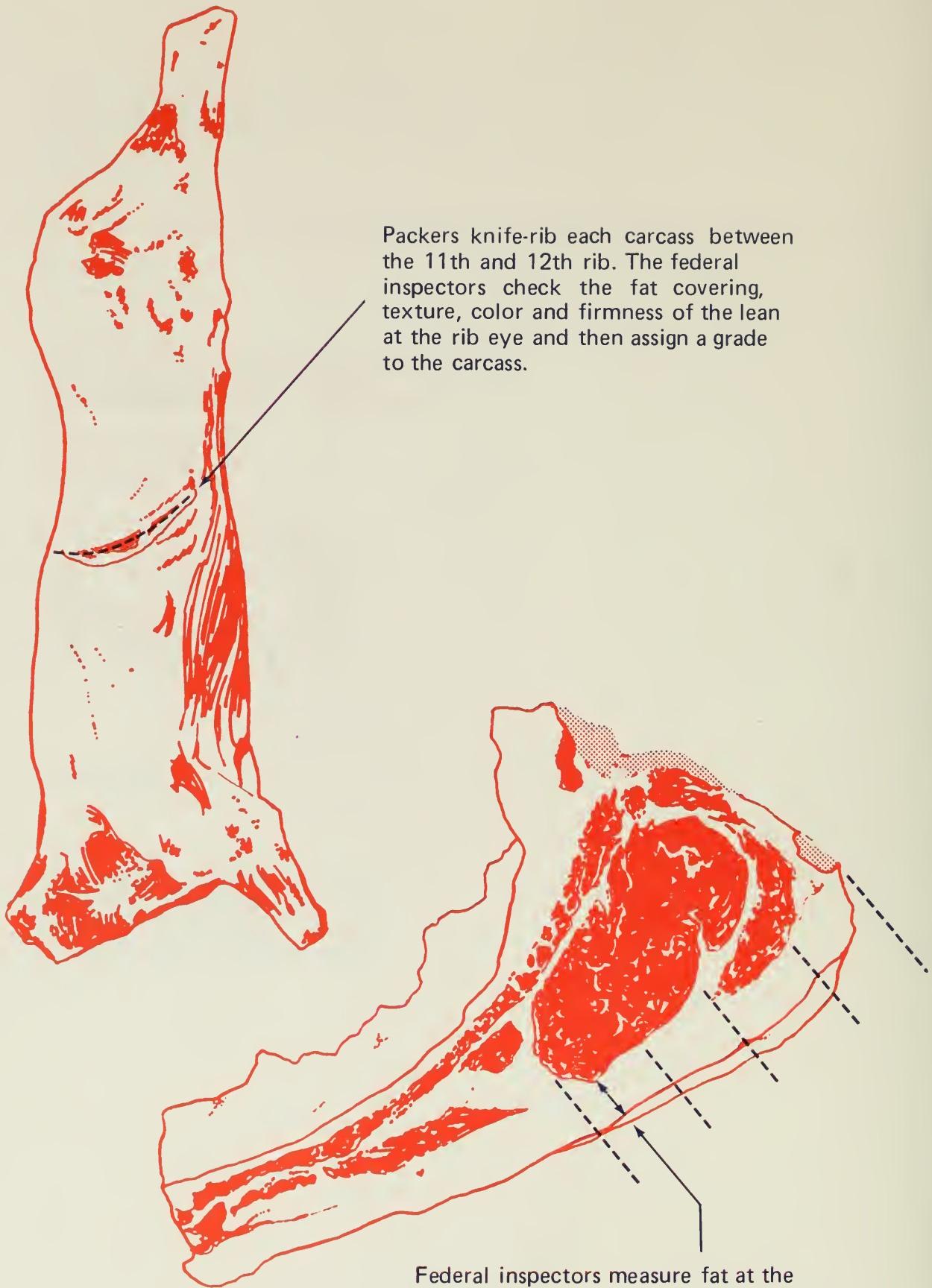
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Packers knife-rib each carcass between the 11th and 12th rib. The federal inspectors check the fat covering, texture, color and firmness of the lean at the rib eye and then assign a grade to the carcass.

Federal inspectors measure fat at the minimum point in the fourth quarter from the vertebra along the longitudinal axis of the rib eye (see arrows). Research has established a direct link between the amount of fat and lean meat yield.

CANADA'S BEEF GRADING SYSTEM

Federal beef grading has been carried out in Canada since 1929 and changes have been made from time to time to keep the grading system in line with a changing beef industry.

The present beef grading system, which was introduced in 1972, added a new concept to the grading operation — that of assessing the meat yield of the carcass when assigning a grade. The meat yield is the percentage of the carcass that can be sold as edible meat.

Research has shown a relationship between meat yield and the amount of fat cover at rib eye. For example, meat yield will be greater from a 315 kg (700 lb) carcass with 6 mm ($\frac{1}{4}$ in.) of fat at the rib eye than from one with 12mm ($\frac{1}{2}$ in.) of fat.

Beef carcasses are evaluated accurately under the current grading system. This system was developed jointly by the Canada Department of Agriculture and the entire beef industry. It resulted from discussions held at the Beef Industry Conference in 1966, sponsored by the Canadian Cattlemen's Association and the Canadian Federation of Agriculture.

The Canadian Cattlemen's Association, Canadian Federation of Agriculture, Meat Packers' Council of Canada, Consumers' Association of Canada and a number of independent operators, retailers, wholesalers, marketing organizations and scientists at research stations and universities across Canada made important contributions to the formulation of the present system.

WHY GRADE?

A grading system is used to divide carcasses into groups on a quality basis. Under the federal system there is one set of grading standards and these are applied uniformly and objectively across Canada.

An effective, uniformly applied grading system is of obvious benefit to consumers, ensuring they get the grade of meat they specify. For commercial buyers, the grading system enables them to order by grade and be sure of obtaining the required quality and fat level. Uniformity in grade standards is of major importance to producers, ensuring that all carcasses are described accurately. In addition, federal grades provide producers with a means of determining the type of product in greatest demand by consumers.

GRADING AND INSPECTION

A federal inspector from the Health of Animals Branch, Canada Department of Agriculture, or a provincial meat inspector must inspect each carcass to be sure that the meat will be wholesome. Then, the federal grader makes his assessment of the carcass.

The grader assesses three factors — maturity, quality and meat yield.

Maturity is the first factor to be considered. The age of the animal affects the quality of the beef — the older the animal, the less likely the carcass will produce tender cuts. The age of the animal is determined by the degree of ossification or hardening of cartilage that is evident in the carcass.

Next, the grader assesses the quality factors — color, texture and firmness — of the carcass. Carcasses with lean meat that is bright red, firm and fine-textured, with some marbling and a firm, white fat cover, produce cuts with the greatest potential for consumer satisfaction. The grade assigned to each carcass will depend on how close it comes to the ideal.

Once the quality factors have been examined, the grader determines the potential meat yield of the carcass. This is done by knife-ribbing the carcass between the 11th and 12th rib in order to measure the depth of fat and determine the quality of the carcass. Knife-ribbing is a cut from the spine, through the rib eye muscle toward the flank, severing the rib cartilages, but not the vertebra. The grader measures the fat covering at the minimum point in the fourth quarter from the vertebra along the longitudinal axis of the rib eye and then assigns a grade (see drawing page 4).

GRADES

Since September 5, 1972, the following grades have been in effect:

Canada A	Canada D, Class 1
Canada B	Canada D, Class 2
Canada C, Class 1	Canada D, Class 3
Canada C, Class 2	Canada D, Class 4
	Canada D, Class 5
	Canada E

Canada A and B quality grades are subdivided into four fat categories depending on the degree of external finish at the rib eye.

FAT LEVEL FOR CANADA A – in inches¹

Warm carcass weight — pounds —	A1	A2	A3	A4
up to 499 ²	.20 – .30	.31 – .50	.51 – .70	over .70
500 – 699	.20 – .40	.41 – .60	.61 – .80	over .80
700 and over	.30 – .50	.51 – .70	.71 – .90	over .90

FAT LEVEL FOR CANADA B – in inches¹

Warm carcass weight — pounds —	B1	B2	B3	B4
up to 499 ²	.10 – .30	.31 – .50	.51 – .70	over .70
500 – 699	.10 – .40	.41 – .60	.61 – .80	over .80
700 and over	.20 – .50	.51 – .70	.71 – .90	over .90

Note: ¹ To obtain centimetres multiply inches by 2.5

² To obtain kilograms multiply pounds by 0.45

Canada A is ribbon-branded with red ink, B with blue, C with brown, and D and E with black ink. All ribbon-branding of Canadian beef is done ONLY under the supervision of a federal grader at point of slaughter.

Carcass weight is an important factor in the grading system. The grading regulations include a definition of a carcass which precisely defines what must be removed prior to weighing. This ensures a standardized procedure in all plants.

In carcasses that grade Canada A or B, the amount of fat covering for each fat class varies depending on the warm carcass weight. It is to these grades that the meat yield factor applies.

Canada A carcasses have the following minimum characteristics:

maturity – youthful

color of lean – bright red

texture of lean – firm and fine-grained, with at least a slight degree of marbling

color of fat – white or slightly tinged with reddish or amber color

fat covering – must be firm and extend well over the carcass but may be somewhat lacking on the hips or chuck (see fat tables for minimum covering at rib eye)

muscling – must be free from marked deficiency

Carcasses that fail to meet any one of these standards are graded Canada B, provided they meet the following requirements:

maturity — youthful
color of lean — medium dark red
texture of lean — moderately firm and slightly coarse grained, no minimum marbling
color of fat — white to pale yellow
fat covering — may be slightly soft and somewhat lacking on the hips and chucks (see fat tables for minimum covering at rib eye)
muscling — must be free from marked deficiency

Canada C, Class 1 includes carcasses ranging in muscling from low medium to excellent but having quality characteristics below the minimum required for Canada A or B. This grade includes youthful heifers and steers or intermediate aged heifers or steers.

Canada C, Class 2 includes carcasses with marked deficiency in muscling.

Carcasses from mature animals are graded as follows:

Canada D, Class 1 — good to excellent muscled mature females and steers
Canada D, Class 2 — medium muscled mature females and steers
Canada D, Class 3 — fair muscled mature females and steers
Canada D, Class 4 — excessively finished, from youthful carcasses which are low medium to deficient in muscling and quality or are mature carcasses having any degree of muscling and quality
Canada D, Class 5 — manufacturing quality (poorly muscled and no fat covering) may include youthful carcasses having fleshing and quality factors below Canada C, Class 2, intermediate and mature carcasses
Canada E — mature stags and bulls

HOW THE GRADES ARE APPLIED

A youthful beef carcass weighing 290 kg (650 lb) with excellent quality and muscling (that is, it meets the standards for Canada A), and has 12 mm ($\frac{1}{2}$ in.) of fat at the rib eye, would grade Canada A2.

If the carcass had a high degree of finish, with a fat thickness at the rib eye of 25 mm (1 in.), it would grade Canada A4. If it had a very thin fat covering — for example, a fat measurement at the rib eye of only 2 mm ($\frac{1}{10}$ in.) — the carcass

would grade Canada B1 even though it might meet the requirements for Canada A in other respects.

If the same carcass had a dark red color and was coarse textured at the rib eye, it would be downgraded to Canada C, Class 2, because it did not meet the quality requirements for either Canada A or B grades.

CONVERSION FACTORS		
Metric units	Approximate conversion factors	Results in:
LINEAR		
millimetre (mm)	x 0.04	inch
centimetre (cm)	x 0.39	inch
metre (m)	x 3.28	feet
kilometre (km)	x 0.62	mile
AREA		
square centimetre (cm^2)	x 0.15	square inch
square metre (m^2)	x 1.2	square yard
square kilometre (km^2)	x 0.39	square mile
hectare (ha)	x 2.5	acres
VOLUME		
cubic centimetre (cm^3)	x 0.06	cubic inch
cubic metre (m^3)	x 35.31	cubic feet
	x 1.31	cubic yard
CAPACITY		
litre (L)	x 0.035	cubic feet
hectolitre (hL)	x 22	gallons
	x 2.5	bushels
WEIGHT		
gram (g)	x 0.04	oz avdp
kilogram (kg)	x 2.2	lb avdp
tonne (t)	x 1.1	short ton
AGRICULTURAL		
litres per hectare (L/ha)	x 0.089	gallons per acre
	x 0.357	quarts per acre
	x 0.71	pints per acre
millilitres per hectare (mL/ha)	x 0.014	fl. oz per acre
tonnes per hectare (t/ha)	x 0.45	tons per acre
kilograms per hectare (kg/ha)	x 0.89	lb per acre
grams per hectare (g/ha)	x 0.014	oz avdp per acre
plants per hectare (plants/ha)	x 0.405	plants per acre

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